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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,122	11/25/2003	Toshio Tsujimoto	245926US0XDIV	4386

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ALEXANDRIA, VA 22314

EXAMINER
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SONG, MATTHEW J

ART UNIT	PAPER NUMBER
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1722

DATE MAILED: 02/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/720,122

Applicant(s)

TSUJIMOTO ET AL.

Examiner

Matthew J. Song

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 14-16 and 18-23 is/are pending in the application.
- 4a) Of the above claim(s) 18-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 21-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Newly submitted claims 18-20 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claim 18-20 are directed to a method, which were restricted from the product claims in 10/162,637 on 11/18/2003.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 18-20 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 14-16 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al (EP 0911429 A1).

Watanabe et al discloses forming a crystallization promoter layer while forming a translucent quartz glass layer and the crystallization promoter may be mixed with powdered silicon dioxide ([0013], [0024]), this reads on applicant's transparent coated layer comprises a crystallization promoter dispersed in a silica matrix on a part of the inside of the crucible ([0024]). Watanabe et al discloses the crystallization promoter is continuously supplied and

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scattered on the surface of the inner wall of the crucible base to form a crystallization promoter-container layer ([0024]). Watanabe et al discloses a quartz glass crucible for use in pulling up silicon single crystals using a Czochralski method, which comprising molten polycrystalline silicon inside the vessel ([0001]-[0002]), this reads on applicant's crucible containing therein polysilicon.

Referring to claim 15, Watanabe et al does not disclose the claimed method of obtaining the crucible, which is a product-by-process claim and the patentability determination of a product-by-process claim is based on the patentability of the product and does not depend on its method of production (MPEP 2113). Watanabe et al discloses a crucible, which meets all of the claimed product limitations of claim 15; therefore Watanabe et al reads on claim 15.

Referring to claim 16, Watanabe et al discloses magnesium, strontium, calcium, barium and barium oxide as the crystallization promoter ([0018]).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (EP 0911429 A1) as applied to claims 14-16 and 21 above, and further in view of Hansen et al (US 5,980,629).

Watanabe et al discloses all of the limitations of claim 22, as discussed previously, except Watanabe et al does not disclose a transparent coated layer is located on the outside surface of the crucible.

In a method of forming a quartz crucible, note entire reference, Hansen et al teaches an external coating is on the outer surface and contains a devitrification promoter (col 4, ln 40-55). Hansen et al teaches the second layer reinforces the silica body (col 3, ln 20-65).

6. Claims 14-16 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al (US 5,980,629) in view of Watanabe et al (US 6,106,610).

In a method of forming a crucible for production of silicon single crystals, note entire reference, Hansen et al teaches a crucible has inner and outer coatings of a devitrification promoter (col 3, ln 1-50 and col 4, ln 40-55). Hansen et al also teaches granular polycrystalline silicon is loaded into the crucible (col 3, ln 50-67) and the devitrification promoter is preferably barium, magnesium, strontium or beryllium (col 6, ln 20-5).

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Hansen et al does not teach the crystallization promoter is dispersed in a silica matrix.

Hansen et al is not particular about the method used to coat the surface of the crucible.

In a method of forming a crucible, note entire reference, Watanabe et al teaches a crystallization promoter can be used either alone or as a mixture with a powder of synthetic silicon dioxide to form a translucent quartz glass layer. Watanabe et al teaches depositing a synthetic silicon dioxide powder sufficiently impregnated with the aqueous solution, and the layer is formed as a coated film or a solid solution layer on the surface (col 3, ln 30-65 and col 4, ln 1-35), this reads on applicant's crystallization promoter dispersed in a silica matrix.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Hansen et al by coating the layer with a crystallization promoter dispersed in a silica matrix as taught by Watanabe et al to prevent the promoter from leaking into the melt, and to improve adherence.

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 14-16 and 21-23 have been considered but are moot in view of the new ground(s) of rejection.

8. Applicant's arguments filed 11/18/2005 have been fully considered but they are not persuasive.

Applicant's argument that the final product can be used to contain polysilicon is noted but is not found persuasive. Watanabe et al clearly teaches a crystallization promoter is scattered on the surface of the inner wall of the crucible, which reads on applicant's claim. The fact that

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there is another inner layer formed on does distinguish the claimed product from the product taught by Watanabe because Watanabe teaches a crystallization promoter layer formed on the inner surface of the crucible.

### *Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew J Song  
Examiner  
Art Unit 1722

MJS  
February 5, 2006

  
**FELISA HITESHEW**  
**PRIMARY EXAMINER**  
*Art 1722*